We introduce the set of definable restricted complex powers for o-minimal expansions of the real field. We calculate it explicitly for structures of the form \((\mathbb{R}, (x^z \upharpoonright [1, 2])_{z \in \mathbb{Z}})\) where \(\mathbb{Z}\) is a subset of the field of complex numbers. For many of these structures, we produce examples of holomorphic functions that are definable and yet not semialgebraic. (Received September 22, 2010)